

466,521

ABSTRACT OF THE DISCLOSURE

Apparatuses and methods are disclosed for determining the alignment of leads on components. Physical and/or superficial fiducial markers on components are used to distinguish the alignment of leads on the component. The alignment of fiducial markers on the component are detected. A predetermined fiducial alignment is provided that corresponds to a predetermined lead alignment. The detected fiducial alignment is compared to a predetermined fiducial alignment to determine the lead alignment. When used in conjunction with a pick and place machine, the methods and apparatuses provide a means for verifying and correcting the lead alignment of components prior to placement and attachment to a substrate.